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PATENT SPECIFICATION

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572,218

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PROVISIONAL SPECIFICATION

Improvements in and relating to Bolts and Nuts

I, ALBERT THOMAS CROSS, "Green Gates", 3, Dixons Hill, North Mimms, Hatfield, Herts., British, do hereby declare the nature of this invention to be as follows:—

This invention relates to bolts and nuts intended for use mainly where lightness and security is desirable. The bolt is virtually a hollow bolt and the nut is made to suit the bolt.

The bolt comprises a coil of suitably stiff wire forming a coiled shank, one end of this coiled shank being formed into, or to accommodate, a suitable head.

1 The nut is a pressing, or machined part, in which is formed a groove, or projections to suit the pitch of the bolt shank coil, and it is so shaped to enable winding on or off this bolt shank coil.

20 This invention is intended, primarily, for use on aircraft but it is also applicable

to other engineering projects which may require small or large bolts and nuts.

Referring to the coiled bolt shank. This shank, whilst possessing sufficient strength to maintain lateral stiffness, is sufficiently flexible to enable it to extend axially, therefore, when the nut is tightened on to the bolt shank a reaction load is created which gives tightness security to the bolt and the nut, also, this coiled shank allows for the bolt and the nut to remain tight when used for bolting together parts made of wood, or other materials, which are liable to shrink or expand under varying climatic, or other, conditions. It is intended that the material from which these coiled shank bolts and nuts be made is not confined to one class of metal only.

Dated the 26th day of January 1944.

ALBERT THOMAS CROSS.

COMPLETE SPECIFICATION

Improvements in and relating to Bolts and Nuts

I, ALBERT THOMAS CROSS, "Green Gates", 3, Dixons Hill, North Mimms, Hatfield, Herts., British, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a new type bolt and nut which embodies new features and methods of manufacture when compared to bolts and nuts as already existing.

The said new features embodied in my invention are lightness, tightness security between the bolt and the nut when the nut is tightened on to parts which are bolted together, provision for expansion and contraction of the bolt after the bolt and nut have been tightened on to parts which are bolted together, the bolt and nut meanwhile remaining securely locked. Also, as the bolt can bend slightly, the ability to use this bolt for bolting together parts in which the bolt holes are not truly in line. These new features, combined with simple construction, introduces an economical bolt and nut which can be used for securing permanent structures, and

the like, in addition to various other uses, including mechanisms requiring shock absorbing fixings.

The bolt consists basically of a coil of wire in the nature of a stiff spring and it is so made that the head of the bolt can be formed direct from the shank wire, this being done by forming an enlarged coil on the end of the bolt shank and then bending up this enlarged coil so as to provide suitable flats to accommodate a relevant spanner jaw, or alternatively, by forming a larger coil than the bolt shank coils and then flattening its side so as to accommodate a relevant spanner jaw. In addition to the aforementioned type heads the coil bolt can be a plain coil fitted with a separate nut at each end, one of these nuts representing the bolt head.

It is intended that the bolt may be made from round, square, or other suitable section wire.

No thread is required on the bolt shank as the thread or projections in the mating nut are such that, when the nut is fitted to the bolt, it automatically engages the coil of the shank as made.

The said nut is a pressing or machined

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part in which is formed a thread groove, or projections, so shaped to suit the pitch and contour of the bolt shank coil and to enable winding on or off this bolt shank coil, otherwise, the nut is not confined to any particular shape. My drawings show, in some cases, an hexagonal nut with flats to accommodate a standard spanner and in one case a wing nut to enable tightening by hand.

I am aware that a wire coiled bolt has already been proposed and which proposed bolt calls for a screw thread cut on the end so as to accommodate a screw threaded mating nut, and the bolt head made as a separate part mechanically fixed to the bolt shank. My invention is so designed to avoid anything in the nature of sharp nicks cut around the internal or external periphery of the coiled wire which constitutes the shank of the bolt and, excepting where a second nut is employed to take its place, the bolt head is made integral with the shank. My mating nut is made to wind on or off the shank coils proper.

It is known that, if a sharp nick such as a screw thread is cut around the periphery of a spring coil which is subjected to a relatively high tension load, this coil is liable to snap either whilst tensioning, or at a later date under fatigue. My bolt is so designed that, if sufficient force is applied to destroy it, it will fail by stringing out and not by snapping apart.

It has also been proposed to fit spiral springs, used in dentistry for regulating or straightening teeth, with nuts that are formed directly to engage the convolutions.

To illustrate my invention I refer to the accompanying drawings:—

Figure 1 is a side elevation showing a bolt and nut. The bolt head is formed by an enlarged wire coil bent up to form flats to accommodate spanner jaw.

Figure 2 is a plan view thereof.

Figure 3 is a side elevation showing a bolt and nut. The bolt head is formed by an enlarged wire coil flattened so as to accommodate spanner jaw.

Figure 4 is a plan view thereof.

Figure 5 is a side elevation of a plain coil bolt fitted with a separate nut at each end.

Figure 6 is a side elevation of a typical bolt fitted with a wing nut.

Referring to:—

Figures 1 and 2. A is the bolt, B is the enlarged coil with sides C bent up to form flats. D is a sectional view of the nut.

Figures 3 and 4. E is the bolt, F is the enlarged coil flattened at G, H is a sectional view of the nut.

Figure 5. J is the plain coil bolt with nuts K and L.

Figure 6. M is typical bolt and N is wing nut.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A bolt made from wire coiled to form a stiff spring and with a head formed directly from the wire, the coils themselves serving as the threads for the reception of the nut, substantially as described.

2. A bolt as claimed in claim 1 but formed without the head, a second nut being employed to take its place, substantially as described with reference to Fig. 5 of the accompanying drawings.

3. A nut in combination with a bolt as claimed in claim 1 or claim 2 and substantially as described with reference to the accompanying drawings.

Dated this 20th day of February, 1945.
ALBERT THOMAS CROSS.

CROSS

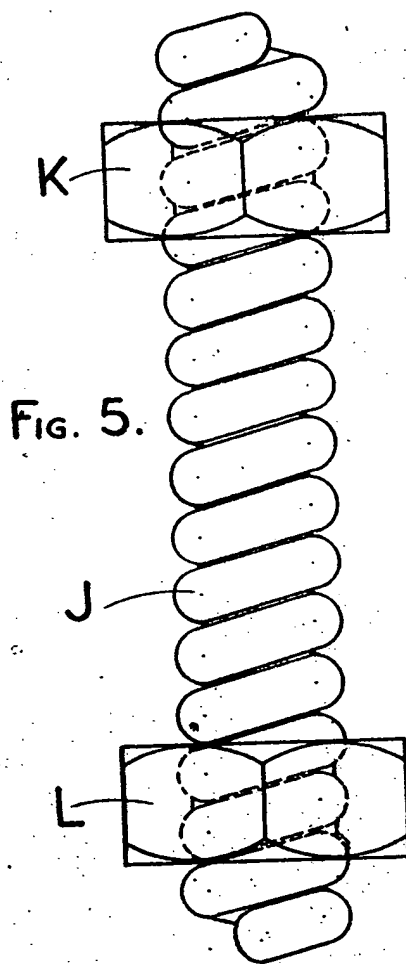


FIG. 5.

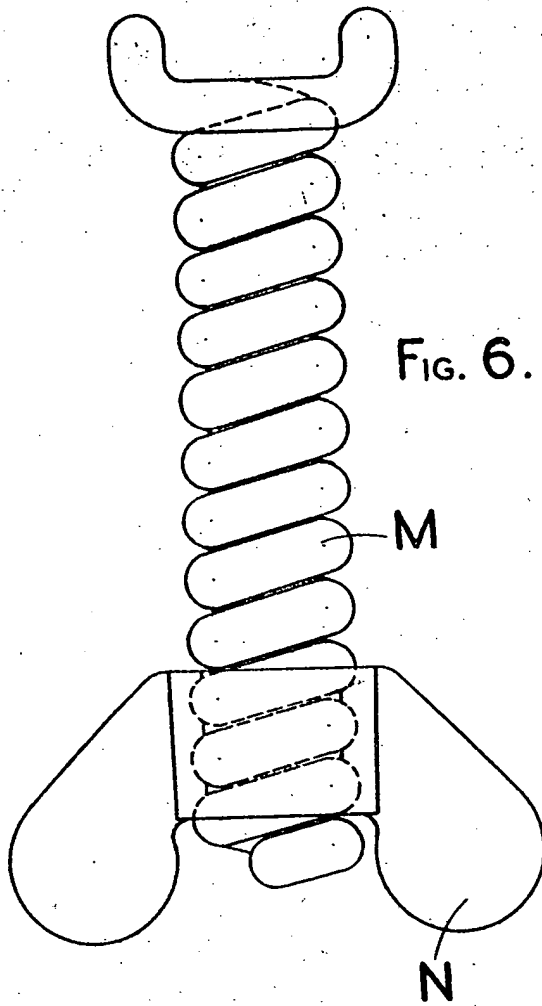


FIG. 6.

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[This Drawing is a reproduction of the Original on a reduced scale.]

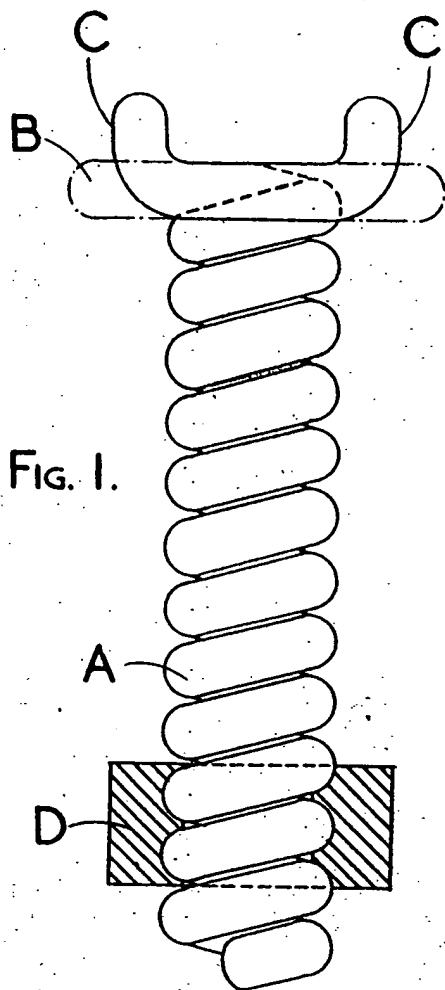


FIG. 1.

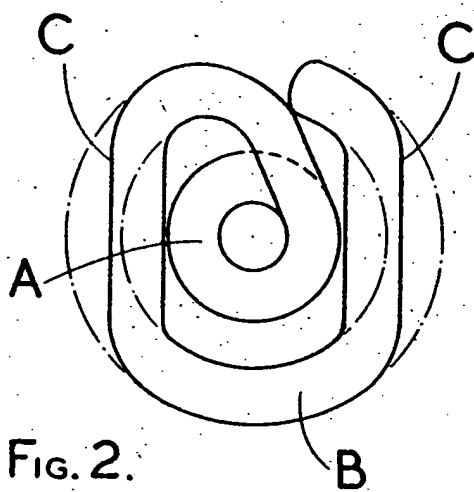


FIG. 2.

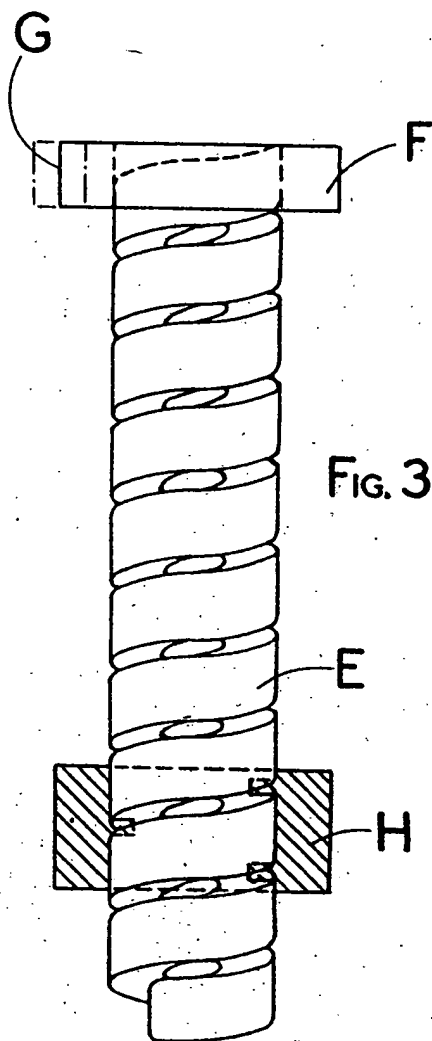


FIG. 3.

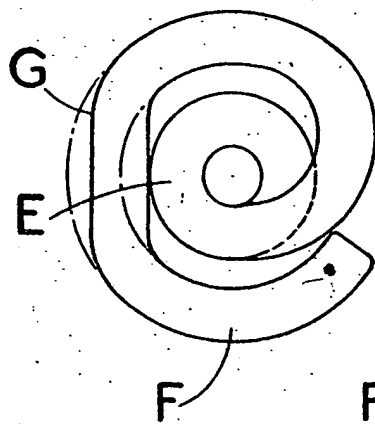


FIG. 4.

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